

**WHAT IS CLAIMED IS:**

1. A method of emulating machine tool behavior for  
a programmable logic controller logical verification system  
5 for manufacturing a motor vehicle, said method comprising the  
steps of:

constructing a mechanical model;

viewing motion of the mechanical model in a motion  
viewer;

10 determining whether the motion of the mechanical  
model is acceptable;

replicating the motion previously defined with PLC  
code if the motion of the mechanical model was acceptable; and

15 using the accepted motion of the mechanical model to  
compare the behavior of the PLC code relative to the accepted  
motion.

2. A method as set forth in claim 1 wherein said  
step of constructing comprises using a mechanical tool design  
20 system to construct the mechanical model.

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3. A method as set forth in claim 2 including the step of constructing an electromechanical model.

4. A method as set forth in claim 3 wherein said 5 step of constructing the mechanical model includes binding the electromechanical model to the mechanical model.

5. A method as set forth in claim 4 wherein said step of constructing the electromechanical model comprises 10 using a PLC logical verification system to construct the electromechanical model.

6. A method as set forth in claim 1 including the step of generating transformational arrays based on computer 15 aided design (CAD) geometries of the mechanical model.

7. A method as set forth in claim 6 including the step of exporting the mechanical model to a control system design system.

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8. A method as set forth in claim 7 including the step of constructing a motion file based on the mechanical model and transformational arrays.

5 9. A method as set forth in claim 8 wherein said step of displaying further comprises playing the motion file by a motion player.

10 10. A method as set forth in claim 8 including the step of returning to the mechanical tool design system if the motion of the mechanical model is not acceptable.

11 11. A method of emulating machine tool behavior for a programmable logic controller logical verification system 15 for manufacturing a motor vehicle, said method comprising the steps of:

constructing a mechanical model;

generating CAD transformational arrays for motion in the mechanical model;

20 20. constructing a motion file based on the mechanical model and the CAD transformational arrays;

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viewing the motion of the motion file in a motion viewer;

determining whether the motion of the mechanical model is acceptable;

5 replicating the motion previously defined with motion commands initiated by PLC code if the motion of the mechanical model was acceptable; and

using the accepted motion of the mechanical model to compare the behavior of the PLC code to the accepted motion.

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12. A method as set forth in claim 11 wherein said step of constructing comprises using a mechanical tool design system to construct the mechanical model.

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13. A method as set forth in claim 12 including the step of constructing an electromechanical model.

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14. A method as set forth in claim 13 wherein said step of constructing the mechanical model includes binding the electromechanical model to the mechanical model.

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15. A method as set forth in claim 14 wherein said step of constructing the electromechanical model comprises using a control system design system to construct the electromechanical model.

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16. A method as set forth in claim 11 wherein said step of generating comprises generating CAD transformational arrays based on computer aided design (CAD) geometries of the mechanical model.

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17. A method as set forth in claim 11 including the step of exporting the mechanical model to a PLC emulator.

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18. A method as set forth in claim 11 wherein said step of displaying further comprises playing the motion file by a motion player.

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19. A method as set forth in claim 11 including the step of returning to the mechanical tool design system if the motion of the mechanical model is not acceptable.